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Goddard Space Flight Center

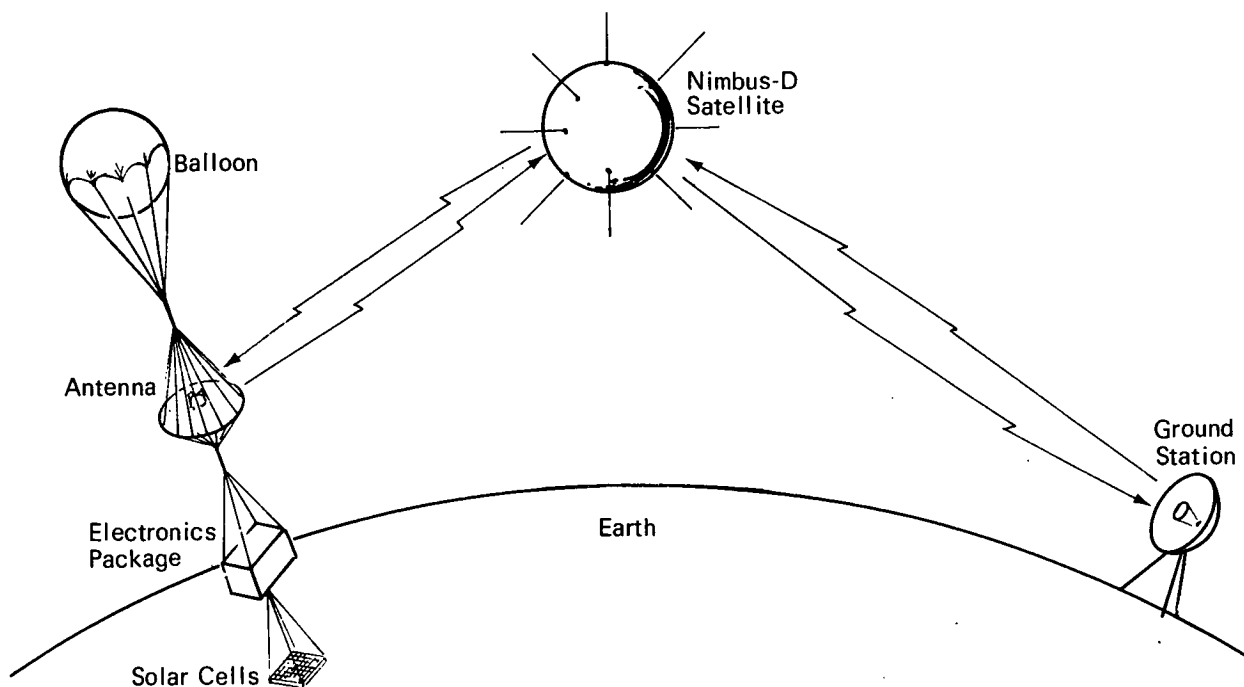


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Wide-Angle, Circularly Polarized, Omnidirectional-Array Antenna

A unique, ultrahigh frequency, broad-beam, omnidirectional, circularly polarized antenna has been designed. The antenna, a modification of the conventional turnstile type, features a bifoliate pattern with

produces a partial null on the axis of the antenna and redirects the antenna's maximum gain to elevation angles of less than 0.79 rad (45 deg) above the horizon. The required pattern shaping is completed by using



relatively high gain and good circularity over the solid area enclosed by the 0.26 and 1.31 rad (15 and 75 deg) angles of elevation.

The high gain and good circularity are achieved by pattern shaping using two techniques: The crossed elements are spaced nearly one-half wave-length apart over a ground plane so that destructive interference

a unique four-element array excited by the horizontal dipoles. The array is formed by four vertical elements mounted at the ends of these dipoles.

Because these antennas are intended for high-altitude weather balloon use, permissible weight is restricted to 0.45 kg (1 lb). This weight problem is overcome by using unique fabrication techniques and

lightweight materials. The ground plane is fabricated from a lightweight expanded-aluminum mesh laminated with an aluminized Mylar film. The composite is then bonded to a tubular aluminum ring. The total assembly weighs 0.125 kg (0.276 lb) and has a high strength-to-weight ratio.

The radiating elements and the element support structure are made from copper-plated glass-epoxy tubing. The total weight of the elements and support structure is 0.091 kg (0.201 lb). The electronic package four-strand support cord and the six-strand stabilizing cords are made of Dacron. Total weight for the entire antenna is less than 0.36 kg (0.8 lb).

Note:

Requests for further information may be directed to:
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Reference: TSP71-10033

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to:

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